

TEKS 7A, E; 8B, C; 12A, C

Kingdom Fungi

Basic Characteristics of Fungi

- Eukaryotic
- Multicellular
- Have a **cell wall** made up of **chitin**.
- External Heterotrophs/ Decomposer
- Not mobile
- Reproduce using **SPORES**
- Sexual and asexual



Evolution of Fungi

Which of the following is **most closely related** to a mushroom (fungus)?
WHY?

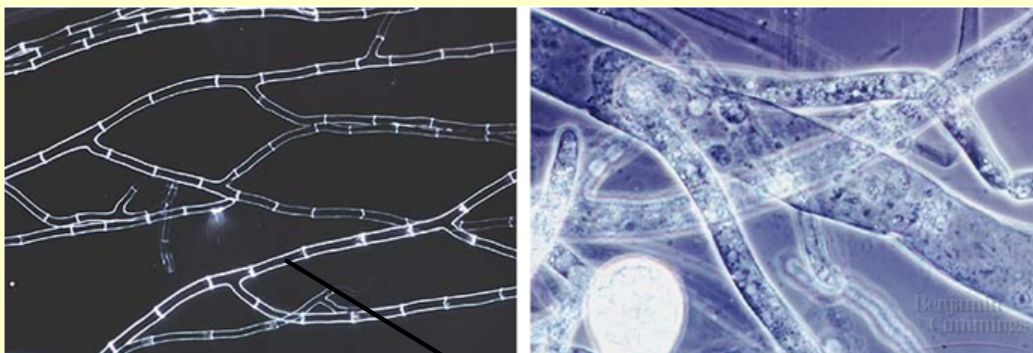
Recent DNA-based studies show that fungi are more similar to animals than to plants

Cladogram

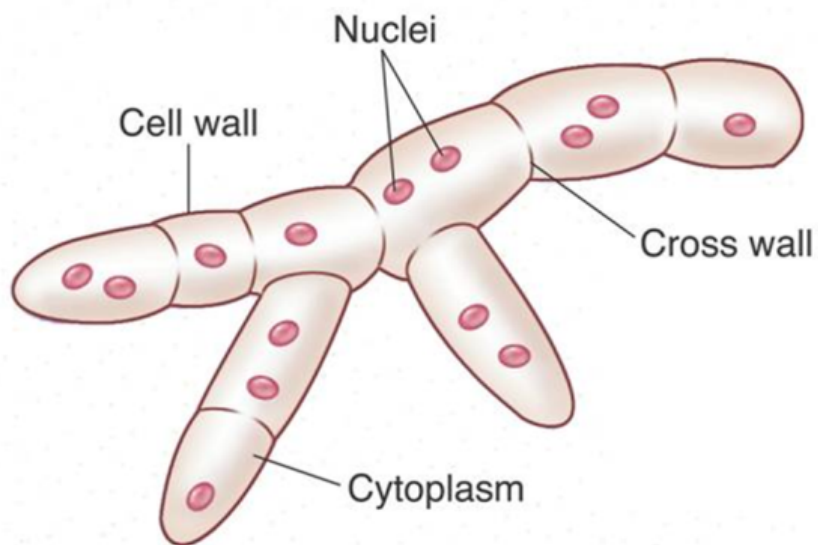


Basic Structure of a Fungus:

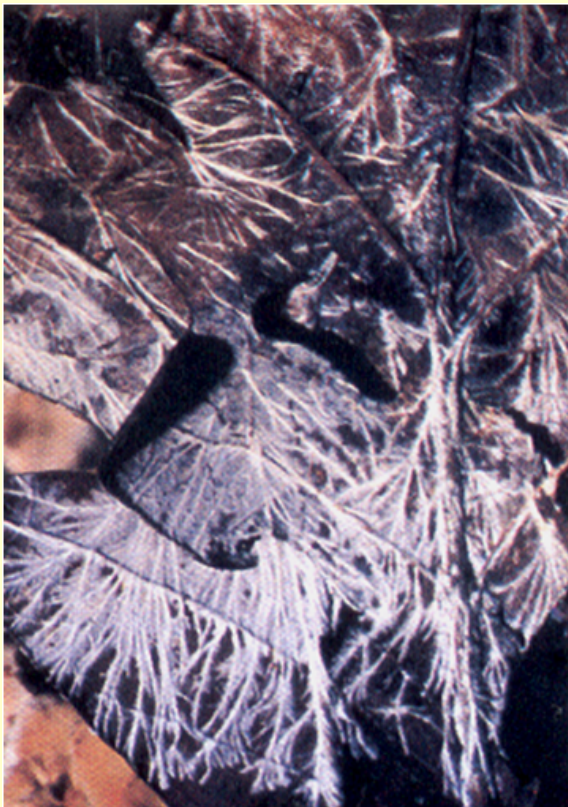
Hyphae are individual filaments that form a dense cottony mat called mycelium.



Individual Hyphae



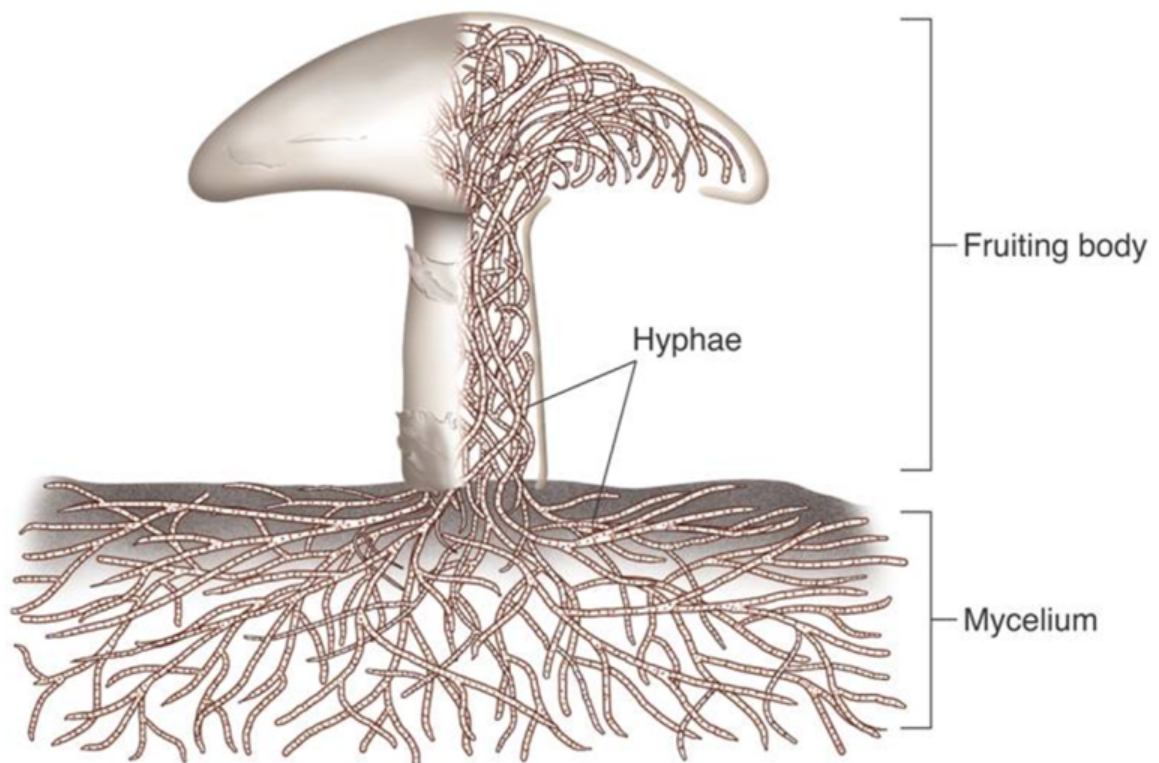
Hyphae With Cross Walls



***Mycelium**
dense mat of
hyphae

This mycelium is
decomposing leaf
litter on the forest
floor.

In mushrooms, the entire above ground mushroom cap is the fruiting body which is the reproductive structure that contains spores.



Four Major Examples of Fungi:

Common Molds

Phylum Zygomycota

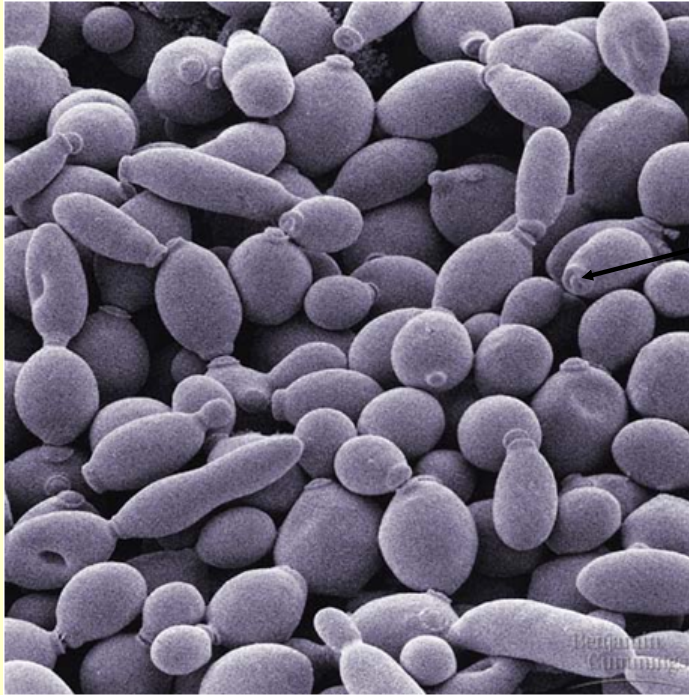
Example - molds that grow on food



Sac Fungi

Phylum Ascomycota

Example - Yeast



Budding
Scar

Club Fungi

Phylum Basidiomycota

Example - Mushrooms



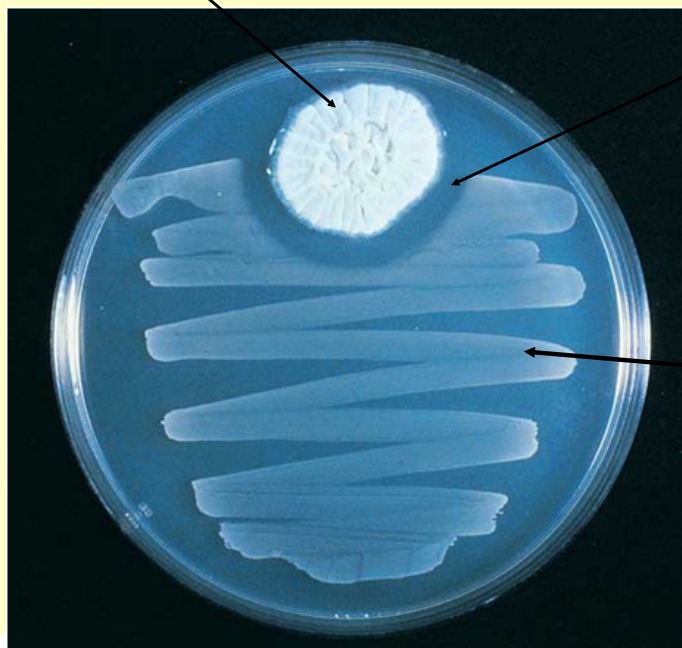
Mushroom Phyla examples:
Toadstool (top left), **Shelf Fungi** (bottom left), **Puff Balls** (right)



Imperfect Fungi

Phylum Deuteromycota

Example - Penicillin mold produces an antibiotic that destroys bacterial cell walls.



Bacteria
Free Zone

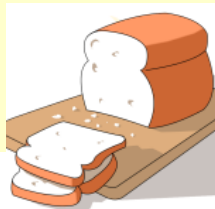
Bacteria
Smear

Anaerobic Respiration

Some fungi (yeast) are able to release energy from glucose in the absence of oxygen. This anaerobic process is called fermentation.

Alcoholic Fermentation

Glucose \rightarrow Pyruvic Acid \rightarrow Alcohol + CO₂ + 2ATP



Helpful to Humans

Some are edible: some mushroom caps, morels, and truffles

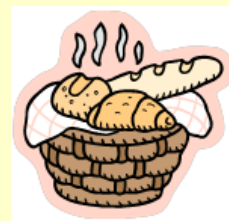


Pigs are used to smell out truffles

Helpful to Humans

Used in food
production:
Cheeses such as Brie,
Blue cheese,
Camembert, &
Roquefort
Bread, Beer, & Wine
(Yeast)
Soy sauce
Tofu

Blue Cheese



Bread

Fungi are
also **helpful** to the
Environment!

**Fungi are *decomposers*,
recycling organic matter.**

- Many fungi are **saprobies**, which are organisms that absorb food from decaying organic matter.

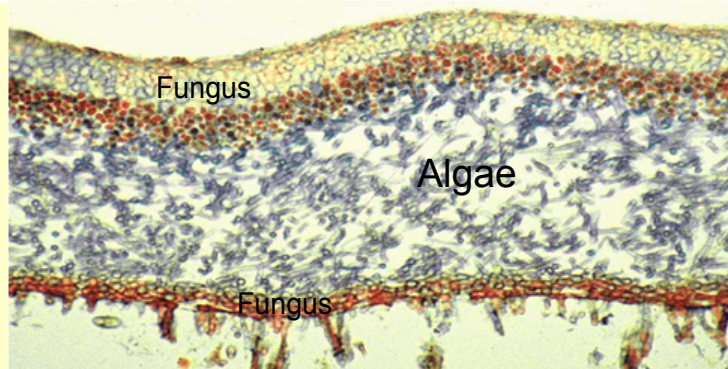
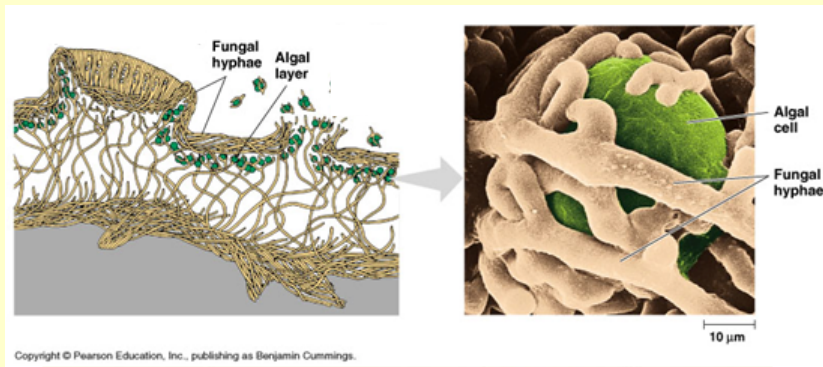


Lichen – has a symbiotic relationship between a fungus and algae.

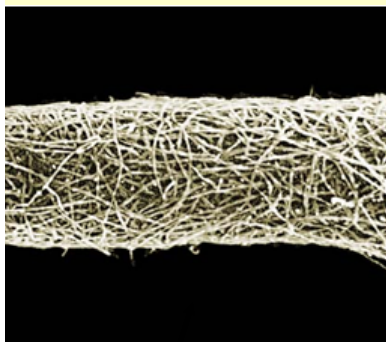
- Provides food for animals
- found in barren soil
- Sensitive to air pollution



Lichen Algal cells live inside the fungus.



Mycorrhizae – a symbiotic relationship b/w a fungus and plant roots. Fungal hyphae extend into the soil and root, helping the plant absorb nutrients.



Plant roots covered with fungal hyphae which increases surface area for absorption.

The last 2 roots on the far right do not have mycorrhizae.

http://www.youtube.com/watch?v=bq1bTduTzC0&feature=player_detailpage

http://www.youtube.com/watch?v=5ZKexZlmuDw&feature=player_detailpage

Harmful Effects of Fungi

Examples of fungal diseases of plants:
Wheat Rust (left), ergots on rye (right)



Pink Ear Rot on Corn



Corn Smut



Fungi will spoil food.



Rhizopus - common

Fungal Diseases of Humans:



- **Athlete's Foot**
- **Ring Worm**
- **-Yeast Infections**

Examples of fungal diseases of animals:



Cat with ringworm

Cordyceps fungi infect insects



Zombie Fungus Rears Its Ugly Head

Photograph courtesy David Hughes

A stalk of the newfound fungus species *Ophiocordyceps camponoti-balzani*, grows out of a "zombie" ant's head in a Brazilian rain forest.